The following listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original): A process for producing synthetic quartz glass, comprising the steps of: feeding to a reaction zone a silica-forming raw material gas and a fluorine compound gas from a first nozzle at the center of a burner having a plurality of concentric nozzles, oxygen gas from a second nozzle disposed concentrically outside the center nozzle, and oxygen gas or hydrogen gas or both from a third nozzle disposed concentrically outside the second nozzle,

flame hydrolyzing the silica-forming raw material gas in the reaction zone to form fine particles of silica,

depositing the silica fine particles on a rotatable substrate in the reaction zone so as to create a porous silica matrix, and

fusing the silica matrix;

wherein the oxygen gas fed from the second nozzle is set at a flow rate with respect to the raw material gas flow rate which represents a 1.1- to 3.5-fold stoichiometric excess of oxygen.

2. (Amended): A process for producing synthetic quartz glass, comprising the steps of:

feeding to a reaction zone a silica-forming raw material gas and a fluorine compound gas from a first nozzle at the center of a burner having a plurality of concentric nozzles, oxygen gas from a second nozzle disposed concentrically outside the center nozzle, ~~and oxygen gas or~~ hydrogen gas ~~or both~~ from a third nozzle disposed concentrically outside the second nozzle, <u>and oxygen gas from a fourth nozzle disposed concentrically outside the third nozzle</u>,

flame hydrolyzing the silica-forming raw material gas in the reaction zone to form fine particles of silica,

depositing the silica fine particles on a rotatable substrate in the reaction zone so as to create a porous silica matrix, and

fusing the silica matrix;

wherein the oxygen gas is fed from the burner at an overall flow rate with respect to the sum of the raw material gas flow rate and the overall hydrogen gas flow rate which represents a 1.1- to 3.5-fold stoichiometric excess of oxygen.

3. (Amended): A process for producing ~~The~~ synthetic quartz glass ~~production process of claim 2,~~ comprising:

feeding to a reaction zone a silica-forming raw material gas and a fluorine compound gas from a first nozzle at the center of a burner having a plurality of concentric nozzles, oxygen gas from a second nozzle disposed concentrically outside the center nozzle, hydrogen gas from a third nozzle disposed concentrically outside the second nozzle, and oxygen gas from a fourth nozzle disposed concentrically outside the third nozzle,

flame hydrolyzing the silica-forming raw material gas in the reaction zone to form fine particles of silica,

depositing the silica fine particles on a rotatable substrate in the reaction zone so as to create a porous silica matrix, and

fusing the silica matrix;

wherein the oxygen gas fed from the second nozzle is set at a flow rate with respect to the raw material gas flow rate which represents a 1.1- to 3.5-fold stoichiometric excess of oxygen, and the oxygen gas is fed from the burner at an overall flow rate with respect to the sum of the raw material gas flow rate and the overall hydrogen gas flow rate which represents a 1.1- to 3.5-fold stoichiometric excess of oxygen.

4. (Amended): A ~~The production~~ process of claim 1, wherein the porous silica matrix has a density of 0.1 to 1.0 g/cm^3.

5. A synthetic quartz glass capable of transmitting ultraviolet light having a wavelength of 157 nm (F_2) produced by fusing and vitrifying the porous silica matrix according to the process of claim 1, which synthetic quartz glass has a hydroxyl group concentration of at most 20 ppm and a fluorine atom concentration of at least 100 ppm,

wherein said glass has a transmittance at 157.6 nm of at least 74.8%.

6. (New): A process of claim 2, wherein the porous silica matrix has a density of 0.1 to 1.0 g/cm^3.

7. (New): A process of claim 3, wherein the porous silica matrix has a density of 0.1 to 1.0 g/cm^3.

8. (New): A process according to claim 1, wherein said silica-forming raw material is a chlorosilane compound, a silane or siloxane compounds of formulas (I) to (III) below, or mixtures thereof:

$$(R^1)_nSi(OR^2)_{4-n} \qquad (I)$$

$$R^3-(\overset{\displaystyle R^3}{\underset{\displaystyle R^3}{\overset{|}{\underset{|}{Si}}}}O)_m-SiR^3_3 \qquad (II)$$

$$\boxed{(\overset{\displaystyle R^3}{\underset{\displaystyle R^3}{\overset{|}{\underset{|}{Si}}}}O)_p} \qquad (III)$$

wherein R^1 and R^2 are each independently an aliphatic monovalent hydrocarbon group; R^3 is a hydrogen atom or an aliphatic monovalent hydrocarbon group; the letter n is an integer from 0 to 3; m is an integer of at least 1; and p is an integer from 3 to 5.

9. (New): A process according to claim 8, wherein R^1 and $R^2$are each independently C_{1-4} alkyl, C_{3-6} cycloalkyl, or C_{2-4} alkenyl and R^3 is H, C_{1-4} alkyl, C_{3-6} cycloalkyl, or C_{2-4} alkenyl.

10. (New): A process according to claim 1, wherein said silica-forming raw material $SiCl_4$, $(CH_3)_2SiCl_2$, $Si(OCH_3)_4$, $Si(OCH_2CH_3)_4$, $CH_3Si(OCH_3)_3$, hexamethyldisiloxane, tetrafluorosilane, trifluoromethane, tetrafluoromethane or mixtures thereof.

11. (New): A process according to claim 1, wherein the oxygen gas fed from the second nozzle flows at a flow rate with respect to the flow rate of raw material gas which represents a 1.5- to 2.5-fold stoichiometric excess of oxygen.

12. (New): A process according to claim 1, wherein the oxygen gas is fed from the burner at an overall flow rate with respect to the sum of the raw material gas flow rate and the

overall hydrogen gas flow rate which represents a 1.5- to 2.5-fold stoichiometric excess of oxygen.

13. (New): A process according to claim 1, wherein feed rate of raw material gas in is 4 to 40 mol/h.

14. (New): A process of claim 1, wherein the porous silica matrix has a density of 0.2 to 0.5 g/cm^3.

15. (New): A process of claim 6, wherein the porous silica matrix has a density of 0.2 to 0.5 g/cm^3.

16. (New): A process of claim 7, wherein the porous silica matrix has a density of 0.2 to 0.5 g/cm^3.

17. A synthetic quartz glass capable of transmitting ultraviolet light having a wavelength of 157 nm (F_2) produced by fusing and vitrifying the porous silica matrix according to the process of claim 2, which synthetic quartz glass has a hydroxyl group concentration of at most 20 ppm and a fluorine atom concentration of at least 100 ppm,

wherein said glass has a transmittance at 157.6 nm of at least 74.8%.

18. A synthetic quartz glass capable of transmitting ultraviolet light having a wavelength of 157 nm (F_2) produced by fusing and vitrifying the porous silica matrix according to the process of claim 3, which synthetic quartz glass has a hydroxyl group concentration of at most 20 ppm and a fluorine atom concentration of at least 100 ppm,

wherein said glass has a transmittance at 157.6 nm of at least 74.8%.